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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/552,234	10/07/2005	Kenichiro Fujimoto	186961/US/2-465122-00015	2045

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DORSEY & WHITNEY LLP
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EXAMINER

HEVEY, JOHN A

ART UNIT	PAPER NUMBER
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4116

MAIL DATE	DELIVERY MODE
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11/29/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/552,234	Applicant(s) FUJIMOTO ET AL.	
	Examiner John A. Hevey	Art Unit 4116	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 November 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14-72 is/are pending in the application.
- 4a) Of the above claim(s) 56-72 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14-55 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/2005 and 5/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I, claims 14-55 in the reply filed on 11/1/2007 is acknowledged. The requirement is therefore deemed proper and made final.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
2. Claims 18-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "predetermined" in claims 18-20 is a relative term which renders the claim indefinite. The term "predetermined" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Furthermore, the claims do not state that the ultrasonic wave is necessarily in the presence of the catalyst support and therefore the fracture ratio is indefinite in view of the claim limitations.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 14-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Frampton (US3969274).

Claim 14 is drawn to a catalyst comprising a catalyst support loaded with a metallic compound, wherein the impurity content of the catalyst is 0.01-0.15 mass%. Claim 15, relevant to dependent claims 16,19-20,22-23,26-27,29-30,34,36-37,40-41,43-44,47-48,50-51,and 54-55 further requires an alkali metal or alkaline earth metal content in the catalyst to be in the range 0.01-0.1 mass%. Frampton teaches a catalyst comprising an active catalytic material and a preformed support, wherein the active catalytic material is a metal, salt, oxide, acid, alloy, or heteropolyacid of an element of Groups IB, IIB, IVB, V, VIB, VIIB and VIII of the Periodic Table of Elements and where the support is a steam treated silica xerogel (see Frampton Claim 1). Frampton further teaches the xerogel support to have a composition of SiO₂ over 99 wt%, Fe₂O₃ 0.01-0.03 wt%, Na₂O 0.02-0.09 wt%, and Al₂O₃ less than 0.4 wt% (see Frampton claim 2).

Claims 16-17 further require the catalyst support with a pore diameter of 8-50 nm, surface area of 80-550 m²/g and pore volume of 0.5-2.0 mL/g.

Frampton teaches the xerogel support to have a pore volume of 0.4-2.2 mL/g,

surface area 20-800 m²/g (see Frampton claim 2) and a specific example of a silica xerogel support having an average pore diameter of 12 nm, pore volume of 1.04 mL/g, and surface area of 350 m²/g (see Frampton example 1).

Claims 21-25 further require the support to be silica with a spherical shape. Frampton teaches the silica gel support made of elementary silica particles having roughly spherical shape (see Frampton column 6, lines 15-18).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frampton (US3969274) in view of Sano et al. (US5604170).

Claims 18-20 further require the catalyst support has a fracture or pulverized ratio of at most 10% when an ultrasonic wave is emitted for a predetermined time and the catalyst is dispersed in water. Frampton does not discuss the properties of the support under an ultrasonic wave. Sano(US'170) teaches a solid catalyst component comprising a transition metal, and oxide of silicon or aluminum where the specific surface area is 150-600 m²/g, pore diameter is 18-1000 Angstroms (1.8-100 nm), and pore volume is 0.3-2.0 cm³/g, and where after the particles are classified into the range of 53-75 microns by a sieving method, the particles are subjected to an ultrasonic disintegration treatment resulting in no more than 30% of the particles being smaller than 50 microns (see Sano Claim 1). The fracture ratio is defined by the instant specification as the mass% of the particles below 20 microns. Although Sano does not explicitly teach the mass% of particles below 20 microns, it would have been obvious to one of ordinary skill in the art to optimize the catalyst support of Frampton in view of Sano to have a fracture ratio of less than 10% when subjected to ultrasonic treatment. One would have been motivated to make such a modification in order to produce uniform support particles having beneficial qualities and increased industrial applicability.

8. Claims 28-31, 35-38, 42-45, and 49- 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frampton (US3969274) in view of McVicker (US4154751).

Claims 28-31 and 35-38 further require the metallic compound contain at least one element selected from iron, cobalt, nickel, or ruthenium. Claims 42-45 and 49- 52 further require the metallic compound be made from a precursor of metallic compound of at least one of an alkali metal or alkaline earth metal content of at most 5%. Frampton teaches the active catalytic material is a metal, salt, oxide, acid, alloy, or heteropolyacid of an element of Groups IB, IIB, IVB, V, VIB, VIIB and VIII of the Periodic Table of Elements (see Frampton claim 1) citing especially the following elements can be used: Cu, Ag, Au, Zn, Cd, Hg, Ti, Bi, Sb, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Re, N, P, As, **Fe, Co, Ni, Ru** [emphasis added], Os, Ir, Rh, Pd, and Pt (see Frampton column 4, lines 40-52). However, the reference does not teach a specific use of Fe, Co, Ni, or Ru alone or with alkali metal or alkaline earth metal precursor content.

McVicker teaches potassium or rubidium-Group VIII metal cluster catalyst for use in Fischer-Tropsch process reactions, supported by a refractory inorganic oxide or carbon (see McVicker claim 6). McVicker teaches a specific example of an iron/alumina catalyst prepared with 2.2 wt% potassium (alkali metal) and a specific example of a ruthenium catalyst prepared with 0.45 wt% potassium (see McVicker table 3 examples B and E).

It would have been obvious for one of ordinary skill in the art to select iron or ruthenium as a catalyst metal from the teachings of Frampton in view of McVicker. Furthermore, it would have been obvious to modify the catalyst

material of Frampton with a K-Fe-Al or K-Ru catalyst metal as taught by McVicker wherein the potassium content is less than 5 wt%.

One would have been motivated to make such modification because it is well known in the art that K is a promoter Fischer-Tropsch synthesis reactions (see McVicker column 2, lines 4-6) and Frampton recognizes the importance of controlling the presence of alkali in the production of catalyst materials and the detrimental effect of highly alkaline solutions to silica gel supports (see Frampton column 5, lines 29-39). The industrial applicability would have been greatly increased by such modification and one would have been expected reasonable success because the modification is considered well within the level of the ordinary skill in the art.

9. Claims 32-34, 39-41, 46-48, and 53-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frampton (US3969274) in view of Sano et al. (US5604170) further in view of McVicker (US4154751).

Claims 32-34 and 39-41 further require the metallic compound contain at least one element selected from iron, cobalt, nickel, or ruthenium. Claims 46-48 and 53-55 further require the metallic compound be made from a precursor of metallic compound of at least one of an alkali metal or alkaline earth metal content of at most 5%. Frampton teaches the active catalytic material is a metal, salt, oxide, acid, alloy, or heteropolyacid of an element of Groups IB, IIB, IVB, V, VIB, VIIB and VIII of the Periodic Table of Elements (see Frampton claim 1) citing especially the following elements can be used: Cu, Ag, Au, Zn, Cd, Hg, Ti, Bi,

SB, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Re, N, P, As, **Fe, Co, Ni, Ru** [emphasis added], Os, Ir, Rh, Pd, and Pt (see Frampton column 4, lines 40-52). However, the reference does not teach a specific use of Fe, Co, Ni, or Ru alone or with alkali metal or alkaline earth metal precursor content.

McVicker teaches potassium or rubidium-Group VIII metal cluster catalyst for use in Fischer-Tropsch process reactions, supported by a refractory inorganic oxide or carbon (see McVicker claim 6). McVicker teaches a specific example of an iron/alumina catalyst prepared with 2.2 wt% potassium (alkali metal) and a specific example of a ruthenium catalyst prepared with 0.45 wt% potassium (see McVicker table 3 examples B and E).

It would have been obvious for one of ordinary skill in the art to select iron or ruthenium as a catalyst metal from the teachings of Frampton in view of Sano, further in view of McVicker. Furthermore, it would have been obvious to modify the catalyst material of Frampton in view of Sano with a K-Fe-Al or K-Ru catalyst metal as taught by McVicker wherein the potassium content is less than 5 wt%. One would have been motivated to make such modification because it is well known in the art that K is a promoter Fischer-Tropsch synthesis reactions (see McVicker column 2, lines 4-6) and Frampton recognizes the importance of controlling the presence of alkali in the production of catalyst materials and the detrimental effect of highly alkaline solutions to silica gel supports (see Frampton column 5, lines 29-39). The industrial applicability would have been greatly increased by such modification and one would have been expected reasonable

success because the modification is considered well within the level of the ordinary skill in the art.

Conclusion

All claims are rejected. No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John A. Hevey whose telephone number is 571-270-3594. The examiner can normally be reached on Monday - Friday 7:30 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on 571-270-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Vickie Kim/

Supervisory Patent Examiner, Art Unit 4116